

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application;

Claim 1. (Currently Amended) An audio processing apparatus for a headphone comprising:

first filter means for processing n-channel audio signals in accordance with predetermined finite impulse response characteristics including a predetermined limited number of delay stages so as to exclude preclude reflective sound components from being produced and for converting the n-channel (where n is a positive integer greater than or equal to 2) audio signals supplied from at least one signal source into a first channel signal and a second channel signal by mixing processed portions of the n-channel audio signals;

a pair of second filter means, one second filter means having a first predetermined transfer function including reflective sound components and receiving the first channel signal and the other second filter means having a second predetermined transfer function different than said first predetermined transfer function and including reflective sound components and receiving the second channel signal output from the first filter means for providing an uncorrelated independent processing by setting different delay times corresponding to said first and second predetermined transfer functions to the first channel signal and the second channel signal, respectively, wherein the first channel signal remains separate from and unmixed with the second channel signal; and

an output unit for respectively supplying signals output from the pair of second filter means to left and right loudspeaker units of a the headphone,

wherein the pair of second filter means each comprise a digital filter providing uncorrelated independent processing by setting delay times corresponding to the respective first and second predetermined transfer functions relating to reflective sound components using delay units having different delay times.

Claim 2. (Cancelled)

Claim 3. (Currently Amended) An audio processing apparatus for a headphone comprising:

first filter means for processing n-channel audio signals in accordance with predetermined finite impulse response characteristics and having a predetermined limited number of delay stages so as to exclude preclude reflective sound components from being produced and for converting the n-channel (where n is a positive integer greater than or equal to 2) audio signals supplied from at least one signal source into a first channel signal and a second channel signal by mixing processed portions of the n-channel audio signals;

a pair of second filter means, one second filter means having a first predetermined transfer function including reflective sound components and receiving the first channel signal and the other second filter means having a second

predetermined transfer function different than said first predetermined transfer function and including reflective sound components and receiving the second channel signal output from the first filter means for providing an uncorrelated independent processing by setting different delay times corresponding to said first and second predetermined transfer functions to the first channel signal and the second channel signal, respectively wherein the first channel signal remains separate from and unmixed with the second channel signal; and an output unit for respectively supplying signals output from the pair of second filter means to left and right loudspeaker units of a the headphone,

wherein the pair of second filter means each comprise a digital filter providing uncorrelated processing by setting delay times corresponding to the respective first and second predetermined transfer functions relating to reflective sound components using a delay unit for outputting a plurality of delay times, a multiplier for setting each delay time output to an arbitrary value, and an adder for adding each multiplier output.

Claim 4. (Previously Presented) The audio processing apparatus according to claim 1, wherein the first filter means comprises a pair of digital filters having the same or equivalent transfer characteristics and a plurality of adders for mixing the processed portions of the n-channel audio signals.

Claim 5. (Previously Presented) The audio processing apparatus according to claim 1, further comprising detection means for detecting a rotational movement of the head of a listener wearing the headphone, wherein the uncorrelated processing of the respective predetermined transfer functions in the pair of second filter means is varied depending on an output from the detection means.

Claim 6. (Previously Presented) The audio processing apparatus according to claim 5, wherein the detection means for detecting the rotational movement of the head of the listener wearing the headphone is a piezoelectric vibration gyro, and the uncorrelated processing corresponding to the respective predetermined transfer functions in the pair of second filter means is varied depending on an output from the piezoelectric vibration gyro.

Claim 7. (Previously Presented) The audio processing apparatus according to claim 5, wherein the detection means for detecting the rotational movement of the head of the listener wearing the headphone is a geomagnetic azimuth sensor, and the uncorrelated processing corresponding to the respective predetermined transfer functions in the pair of second filter means is varied depending on an output from the geomagnetic azimuth sensor.

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Claim 8. (Cancelled)